MASTER

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The sequence of soil and air monthly mean temperatures in the Monthly Weather Report District Values

DATA

The Monthly Weather Report publishes a summary of mean deviationsfrom average of monthly soil and air temperatures for six districts of England and Wales. These values, with their known limitations, were used as basic data.

METHOD

For each pair of successive months, a series of 2 x 2 tables were computed, showing the earth temperatures for the earlier month, positive or negative, against the air temperatures for the following month, positive or negative, over the 40 years, 1921-60.

RESULTS

The simple results are shown in Table I - the percentage of warm months in the air which followed warm months in the soil - 'warm' in this context being defined as having a positive deviation in the Table of District Values, and also in Table II - the percentage of cold months in the air which followed cold months in the soil - 'cold' being defined as having negative deviations.

DISCUSSION

As there were more warm months than cold months during this period, Table I exaggerates the apparent influence of the earlier warm month in the soil, and conversely, Table II minimise any influence of earlier cold in the soil. A better perspective is obtained as follows, after taking the mean of all districts :-

Previous Month				Following Month		
	Percentage warm air after warm soil	Percentage warm all months	Ratio	Percentage cold air after cold soil	Percentage cold all months	Ratio
December	54	55	1.0	45	45	1.0
January	77	55	1.4	67	45	1.5
February	67	57	1.2	54	43	1.3
March	77	65	1.2	47	35	1.3
April	60	60	1.0	39	40	1.0
May	78	62	1.3	53	38	1.4
June	66	59	1.1	47	41	1.1
July	72	66	1.1	49	34	1.4
August	71	65	1.1	45	35	1.3
September	68	63	1.1	54	37	1.5
October	72	67	1.1	40	33	1.2
November	62	58	1.1	60	42	1.4

CONCLUSION

Except after December and April, there seems to have been a tendency for 'warm' months in the air to follow 'warm' months in the soil, and 'cold' to follow 'cold' judged by the published District Values.

/Chi-squared

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Chi-squared tests on this tendency show:-

Significance at 5 per cent level	Districts
January - February	North East, North West
February - March	Midlands
March - April	South-East
November - December	South-West

Significance at 1 per cent level	
January - February	East, Midlands, South-East, South-West
May - June	North-East, North-West
July - August	South-East
September - October	North-East

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Agricultural Memorandum No. XLIII
Bracknell,
November, 1961.

G.13589/MB/11/61/60

Table I. Percentage of warm months in the air following warmmonths in the soil

Previous month	Monthly weather Report Region					
	N.E.	E	Mid.	S.E.	N.W.	S.W.
December	46	61	58	61	48	52
January	75	85	79	77	70	75
February	65	69	74	70	57	69
March	69	80	74	81	76	81
April	60	54	61	50	64	69
May	79	79	77	71	88	73
June	64	73	67	63	67	60
July	73	75	74	77	74	58
August	74	79	75	66	67	68
September	75	70	68	71	65	61
October	77	73	67	74	71	68
November	68	61	60	62	61	61

Table II. Percentage of cold months in the air following cold months in the soil

Previous Month	Monthly Weather Report Region					
	N.E.	E	Mid	S.E.	N.W.	S.W.
December	43	41	50	35	47	53
January	65	75	62	78	55	70
February	59	57	57	55	53	43
March	43	40	48	53	53	47
April	50	42	33	30	33	45
May	63	46	52	53	58	44
June	40	45	45	44	58	50
July	50	44	38	78	47	37
August	46	43	44	36	46	53
September	75	40	44	55	55	55
October	43	39	46	46	33	33
November	55	42	50	60	75	78

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